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EXAMINER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _07 August 2007_.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under _Ex parte Quayle_, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-3 and 5-18_ is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-3 and 5-18_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

DETAILED ACTION

Response to 08/07/2007 Amendment

1.   The amendment filed on 08/07/2007 has been entered.

Response to Arguments

2.   Applicant's arguments filed 08/07/2007 have been fully considered but they are

not persuasive for the following reasons.

The arguments concerning the 35 USC 112 first paragraph rejection have been

fully considered but they are not persuasive because the claimed "real object" is similar

to the objects in real space that are measured by stylus 1060 in order to determine the

3D coordinates of the constraining shape. See applicants specification at [0043],

[0051], [0052], and [0079] (at line 5 note "constraining plane 2000 on the real object").

According to applicants specification points of the "real object" are received from stylus

1060 and are not received by moving the "real object". Alternative means for stylus

1060 are briefly mentioned in paragraphs [0028], [0041], [0050], [0068], and [0078],

however, points of the "real object" would then be received from an alternative to stylus

1060 and would not be received by moving the "real object". Thus, applicants use in the

originally filed specification of "object" with regards to real space and applicants use in

the originally filed specification of "real object" defines "real object" differently than the

amended claim define "real object", therefore, the originally filed specification does not

convey that applicant moves the "real object" to obtain the points forming the

constraining shape. The previous objection to the amendment filed 1/30/2007 with

regards to the amendment to the specification and the 112 first paragraph rejection is maintained and reproduced below.

The arguments concerning the 35 USC 102 first paragraph rejection have been fully considered but they are not persuasive because as discussed by applicant in response to the 35 USC 112 first paragraph rejection and discussed in applicants specification at paragraphs [0028], [0041], [0050], [0068], and [0078] alternative means for stylus 1060 for inputting the 3D coordinates of the constraining shape is possible, thus, the claimed "inputting means for inputting three-dimensional position information of a plurality of positions inputted by moving a real object in the real space by a user, the real object being capable of measuring the position and orientation in the real space" of claim 1; "an inputting step of inputting three dimensional position information of a plurality of positions inputted by moving a real object in the real space by a user, the real object being capable of measuring the position and orientation in the real space" of claim 5; "obtaining three-dimensional position information of a plurality of positions designated by an operating unit moved by a user in the real space, the operating unit being capable of measuring the position and orientation" of claim 10; and "an inputting unit configured to input three-dimensional position information of a plurality of positions inputted by moving a real object in the real space by a user, the real object being capable of measuring the position and orientation in the real space" of claim 16 may be means other than stylus 1060 which alternative means is taught by 6 DOF tracker device of Kitamura. Applicant amended the setting means of claim 1, the setting step of claim 5, the obtaining a constraining step of claim 10, and the setting unit

of claim 16 to claim "constraining shape by using a shape generated based on the

inputted (or obtained) three-dimensional information". The 6 DOF tracker device of

Kitamura suggests using the 6 DOF tracker device to input 3D coordinates of the

constraining shape since a means to input the constraining shape is inherently present

and because the real object with inputted constrained properties is moved by the user

using the 6 DOF tracker device which will allow for less input devices being used in

Kitamura's system. Additionally section 2 at lines 7-14 states "To bring an object that

already exist in the real world into a computer-generated virtual world, it is necessary to

construct accurate shape representation of the real object in a computer system. A

traditional method for this is to use conventional modeling software after precisely

measuring the size or length of the real object by hand." which suggests using a

computer input device to measure the real object in order to have accurate shape

representation of the real object's constraining shape. The previous 102 rejection is

therefore converted into a 103 rejection to address the amendments to the setting

means of claim 1, the setting step of claim 5, the obtaining a constraining step of claim

10, and the setting unit of claim 16.

Response to 01/30/2007 Amendment

3.   As discussed in the previous office action in paragraph 2 mailed on 05/07/2007,

the amendment filed 1/30/2007 is objected to under 35 U.S.C. 132(a) because it

introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment

shall introduce new matter into the disclosure of the invention. The added material

which is not supported by the original disclosure is as follows: the changes made to

paragraph [0006] enters new matter because the "object" is not clearly limited to the

stylus discussed at paragraph [0028]. Applicant is required to cancel the new matter in

the reply to this Office Action.

Claim Rejections - 35 USC § 112

4.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5.   Claims 1-3, 5-9, and 16-18 are rejected under 35 U.S.C. 112, first paragraph, as

failing to comply with the written description requirement. The claim(s) contains subject

matter which was not described in the specification in such a way as to reasonably

convey to one skilled in the relevant art that the inventor(s), at the time the application

was filed, had possession of the claimed invention. The amendment to independent

claims 1, 5, and 16 "input three-dimensional position information of a plurality of

positions inputted by moving a real object in the real space by a user" is not conveyed

by the originally field disclosure because an object is different than the stylus discussed

at paragraph [0028] that would be moved by the user. Currently applicant is claiming to

move any real object while the application only supports moving stylus 1060. Figures 2,

10, and 12-14 shows stylus 1060 but do not convey that any real object may be moved

to input three-dimensional position information.

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7.   The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

8.   This application currently names joint inventors. In considering patentability of

the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g)

prior art under 35 U.S.C. 103(a).

9.   Claims 1-3 and 5-18 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Yoshifumi Kitamura and Fumio Kishino, Consolidated Manipulation of Virtual and

Real Objects, September 1997, Proceedings of the ACM symposium on Virtual reality

software and technology, pages 133-138. Kitamura teaches an augmented reality

system that uses object constraints to control the visual interaction between the virtual

objects and the real objects.

A detailed analysis of the claims follows.

Claim 10:

Kitamura teaches an information processing method for changing the position

and orientation of a virtual object in mixed reality space obtained by combining a real

space and a virtual space, said method comprising the steps of:

obtaining three dimensional position information of a plurality of positions

designated by an operating unit moved by a user in the real space (*In view of page 135*

first paragraph under the heading of 5 Consolidated Manipulation Environment of

Kitamura the same 6 DOF tracker device is used to control the position of a virtual world

object(s) and to control the position of a constraining real world object(s) which is similar

to applicants system where stylus 1060 is used to control the virtual world object(s) and

to control the location of the constraining real world object(s), see applicants paragraphs

[0028], [0030], and [0041]. The 6 DOF has a stylus the user moves which meets the

"operating unit moved by a user in the real space" claim limitation.), the operating unit

being capable of measuring the position and orientation in the real space (*The 6 DOF*

measures position and orientation in real space of the sylus on the 6 DOF.);

determining an input of a constraining shape or an operation of the virtual object

(*The system determines if a shape having constraints is being input for the real object*

such as a toy block (section 4.1) or surface (section 5.4) or such as moving the real

object which has a constraining shape and the system determines if the user is moving

the virtual object.);

Kitamura does not fully teach: obtaining a constraining shape <u>by using a shape</u>

<u>generated based on the obtained three-dimensional position information</u> in the case of

the input of the constraining shape (*The first paragraph in section 5 on page 135*

describes the user using a 6 DOF tracker device to manipulate the virtual world objects

and to position the constraining real world objects. The shape of the real world object(s)

are used to constrain the movement of the virtual world object(s) by giving the real world

object(s) a shape that the virtual world object(s) interacts with in a constrained manner. A

step of inputting the shape of the real world objects constraining shape is inherently

present.). Kitamura's use of the 6 DOF tracker device to control the position of the real

world object suggests using the same 6 DOF tracker device to input the constraining

shape of the real world object since this would require less input devices for the user to

use and learn how to use. Additionally section 2 at lines 7-14 states "To bring an object

that already exist in the real world into a computer-generated virtual world, it is

necessary to construct accurate shape representation of the real object in a computer

system. A traditional method for this is to use conventional modeling software after

precisely measuring the size or length of the real object by hand." which suggests using

a computer input device to measure the real object in order to have accurate shape

representation of the real object's constraining shape.   Thus, it would have been

obvious to one of ordinary skill in the art at the time of applicants invention to input with

the 6 DOF tracker device the 3D coordinates of the constraining shape because the toy

block (section 4.1) or surface (section 5.4) need to have their respective constraining

coordinates input in order for the virtual object to properly interact with the real objects

since this will require less input devices for the user to use and learn how to use and

because section 2 at lines 7-14 suggests using a computer input device to measure the

real object in order to have accurate shape representation of the real object's

constraining shape. KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385 (U.S.

2007), U.S. Supreme Court No. 04-1350 Decided April 30, 2007, 127 SCt 1727, 167

LEd2d 705.;

Kitamura further teaches changing the position and orientation of the virtual

object according to instructions from the user, based on the obtained constraining

shape as constraint condition in case of the operation of the virtual object (*The first*

paragraph in section 5 on page 135 describes the user using a 6 DOF tracker device to

manipulate the virtual world object(s). The shape of the real world object(s) are used to

constrain the movement of the virtual world object(s) by giving the real world object(s) a

shape that the virtual world object(s) interacts with in a constrained manner. Sections

5.1 to 5.4 discusses manipulation of the virtual world object based upon constraint

conditions based on the shape of the real world object in response to the user using the

6 DOF tracker device. The constraining shape generated from the three-dimensional

position information constrains the interaction of the virtual world object with the real

world object, see sections 2, 4 to 5.4. The introduction on page 133 second full paragraph

discusses augmented reality which synthesizes a virtual object with a real object. Section 5.1

discusses after movement is detected by the 6DOF manipulator the virtual object is moved

according to the constraints.); and

combining an image of the virtual object generated according to the changed

position and orientation, and the real image (*The introduction on page 133 second full*

paragraph discusses augmented reality which synthesizes a virtual world object with a real

world object. Section 5.1 discusses after movement is detected by the 6DOF manipulator the

virtual world object is moved according to the constraints of the real world object. Sections

2, 4, and 5 discusses mixing the virtual and real world images of virtual and real world

objects.).

Claim 11:

Kitamura teaches an information processing method according to Claim 10,

further comprising the step of combining a virtual image indicating the constraining

shape with the real image (*The introduction on page 133 second full paragraph discusses*

augmented reality which synthesizes a virtual object with a real object. Section 5.1 discusses

after movement is detected by the 6DOF manipulator the virtual object is moved according to

the constraints. Sections 2, 4, and 5 discusses mixing the virtual and real world images

of virtual and real world objects.).

Claim 12:

Kitamura teaches an information processing method according to Claim 10,

wherein the constraining shape is a plane. (*On page 136 in the text above figure 2 discusses*

determining a plane and using the plane to constrain movement of the virtual object is discussed with

regards to figure 2.).

Claim 13:

Kitamura teaches an information processing method according to Claim 10,

wherein said changing step changing the position and orientation of the virtual object is

carried out by changing the position and orientation of the operating unit (*The 6 DOF*

tracker device is an operating unit. The user using the 6 DOF tracker device

manipulates the virtual objects by changing the position and orientation of the 6 DOF

tracker device.).

Claim 14:

Kitamura teaches a computer program product comprising a computer readable

medium storing computer program code for performing the information processing

method according to Claim 10 wherein the information processing method is executed

by a computer device (*This article is directed to computers that generate the augmented*

reality scene since it was published by ACM for a symposium on virtual reality software

and technology and since at page 133 in the last sentence in the second paragraph of

section 1 "software/hardware" is discussed. Software causing a computer to perform

Kitamura's augmented reality is inherently stored in a computer readable recording

medium.).

Claim 15:

Kitamura teaches a computer-readable recording medium, storing the computer

program according to Claim 14 (*Software causing a computer to perform Kitamura's*

augmented reality is inherently stored in a computer readable recording medium.).

Claim 16:

The functions of Kitamura corresponds to the claimed units because the software

causes the computer to become a unit that performs a process. As seen below

Kitamura performs the claimed processes.

Kitamura teaches an information processing device for aiding control operations

relating to controlling the position and orientation of a virtual object, said device

comprising:

an image capturing unit configured to capture a real image in real space (*The*

measurements by the user in three dimensional real space, the device for obtaining the

3-D shape by using a range image, and the device for obtaining the 3-D shape by using

multiple cameras captures a real image in real space. The three paragraphs found in

section 2 on page 134 of Kitamura teaches the user measuring the real objects, a device

measuring the real objects with range in response to the user, or a device measuring the

real objects with multiple cameras range in response to the user. The claim does not limit

the form of the real image, thus, Kitamura teaches this limitation. Note applicants paragraph

[0024] does not restrict the image capturing unit to a particular type);

a virtual image generation unit configured to generate a virtual image of a virtual

object according to the position and orientation of said image capturing unit (*Kitamura*

discusses in section 2 in the first paragraph using conventional modeling software after

precisely measuring the size or length of the real object by hand or by the devices which

is an generation unit capable of generating three-dimensional positional information.

Sections 2, 4 and 5 discuss generating a virtual image(s) of a virtual object(s).) ;

a superimposing unit configured to superimpose the generated virtual image with

the captured real image (*Sections 2, 4, and 5 discusses mixing the virtual and real world*

images of virtual and real world objects.);

a determination unit configured to determine an input of a constraining shape or

an operation of the virtual object (*The system determines if a shape having constraints*

is being input for the real object such as a toy block (section 4.1) or surface (section 5.4)

or such as moving the real object which has a constraining shape and the system

determines if the user is moving the virtual object.);

an inputting unit configured to input three-dimensional position information of a

plurality of positions inputted by a moving a real object in the real space by a user (*In*

view of page 135 first paragraph under the heading of 5 Consolidated Manipulation

Environment of Kitamura the same 6 DOF tracker device is used to control the position

of a virtual world object(s) and to control the position of a constraining real world

object(s) which is similar to applicants system where stylus 1060 is used to control the

virtual world object(s) and to control the location of the constraining real world object(s),

see applicants paragraphs [0028], [0030], and [0041]. The 6 DOF has a stylus the user

moves which meets the "moving a real object limitation in the real space by a user"

claim limitation.), the real object being capable of measuring the position and orientation

in the real space (*The 6 DOF measures position and orientation in real space of the sylus on the 6 DOF.*);

Kitamura does not fully teach: a setting unit configured to set a constraining shape by using a shape generated based on the inputting three-dimensional position information in the case of the input of the constraining shape (*The first paragraph in section 5 on page 135 describes the user using a 6 DOF tracker device to manipulate the virtual world objects and to position the constraining real world objects. The shape of the real world object(s) are used to constrain the movement of the virtual world object(s) by giving the real world object(s) a shape that the virtual world object(s) interacts with in a constrained manner. A step of inputting the shape of the real world objects constraining shape is inherently present.*). Kitamura's use of the 6 DOF tracker device to control the position of the real world object suggests using the same 6 DOF tracker device to input the constraining shape of the real world object since this would require less input devices for the user to use and learn how to use. Additionally section 2 at lines 7-14 states "To bring an object that already exist in the real world into a computer-generated virtual world, it is necessary to construct accurate shape representation of the real object in a computer system. A traditional method for this is to use conventional modeling software after precisely measuring the size or length of the real object by hand." which suggests using a computer input device to measure the real object in order to have accurate shape representation of the real object's constraining shape. Thus, it would have been obvious to one of ordinary skill in the art at the time of applicants invention to input with the 6 DOF tracker device the 3D coordinates of the

constraining shape because the toy block (section 4.1) or surface (section 5.4) need to

have their respective constraining coordinates input in order for the virtual object to

properly interact with the real objects since this will require less input devices for the

user to use and learn how to use and because section 2 at lines 7-14 suggests using a

computer input device to measure the real object in order to have accurate shape

representation of the real object's constraining shape. KSR International Co. v. Teleflex

Inc., 82 USPQ2d 1385 (U.S. 2007), U.S. Supreme Court No. 04-1350 Decided April 30,

2007, 127 SCt 1727, 167 LEd2d 705.; and

Kitamura further teaches an operating unit configured to control the position and

orientation of the virtual object based on the constraining shape in accordance with the

a user's instruction in case of the operation of the virtual object.(*Sections 5.1 to 5.4*

discusses manipulation of the virtual world object based upon constraint conditions

based on the shape of the real world object in response to the user using the 6 DOF

tracker device. The constraining shape generated from the three-dimensional position

information constrains the interaction of the virtual world object with the real world object,

see sections 2, 4 to 5.4. The introduction on page 133 second full paragraph discusses

augmented reality which synthesizes a virtual object with a real object. Section 5.1 discusses

after movement is detected by the 6DOF manipulator the virtual object is moved according to

the constraints.).

Claim 17:

Kitamura teaches an information processing device according to Claim 16,

wherein the constraining shape is defined by polygons (*Figure 2's Cubes are formed*

with polygons.) and the apexes of the polygons are at positions inputted by the user (*As*

discussed in the a setting unit above it would have been obvious to use the 6 DOF

tracker device to input the constraining shape of the real world object which would input

the apexes of the constraining shape of the polygon.) or the constraining shape is a

plane passing through the positions inputted by the user (*A real sensed surface is a*

planar real world object whose position is inputted by the user in the setting unit. *As*

discussed in the a setting unit above it would have been obvious to use the 6 DOF

tracker device to input the constraining shape of the real world object which would input

plane for a surface.).

Claim 18:

Kitamura teaches an information processing device according to Claim 16,

wherein said operating unit performs at least one of the following operations in

performing an operation controlling the position and orientation of the virtual object:

a translation operation for causing translational movement of the virtual object

based on the constraining shape (*Page 137 column 1 lines 1-3 teaches translation*

when the virtual object collides with the real surface.); or

a rotation operation for rotating the virtual object on an axis which is a normal

vector at a plane where the constraining shape and the virtual object come into contact

(*Page 137 column 1 lines 1-3 teaches rotation when the virtual object collides with the*

real surface.) (*Page 137 column 1 lines 1-3 also teaches translation and rotation when*

the virtual object collides with the real surface).

Claims 1-3:

Means plus function claims 1-3 correspond to device claims 16-18 and the

means of Kitamura, software and computer, are equivalent to applicant's means of

software and computer.

Claims 5-7:

Step for claims 5-7 correspond to device claims 16-18 and the steps of Kitamura,

software and computer, are equivalent to applicant's steps performed by software and

computer.

Claims 8 and 9:

Claims 8 and 9 mirror claims 14 and 15 addressed above and they are rejected

for the same reasons given above for claims 14 and 15.

10.   Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).   .

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffery A Brier whose telephone number is (571) 272-7656. The examiner can normally be reached on M-F from 7:30 to 4:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi, can be reached at (571) 272-7664. The fax phone Number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jeffery A. Brier/
Primary Examiner, Division 2628